

## CLAIMS

## WHAT IS CLAIMED IS:

1. An heat sink device for dissipating heat from an electronic  
2 component, the heat sink device comprising:  
an heat-dissipating substrate having one or more apertures; and  
4 one or more heat-dissipating studs attached within said one or more  
apertures within said heat-dissipating substrate such that the electronic  
6 component may be attached to the heat-dissipating stud.
2. The application specific heat sink device in accordance with claim  
2 1, wherein said one or more apertures in said heat-dissipating substrate  
extend from a first side to a second side of said heat-dissipating substrate.
3. The application specific heat sink device in accordance with claim  
2 1, wherein said one or more apertures in said heat-dissipating substrate are  
cylindrical, conical or stepped.
4. The application specific heat sink device in accordance with claim  
2 1, wherein said one or more apertures in said heat-dissipating substrate are  
pyramidal.
5. The application specific heat sink device in accordance with claim  
2 1, wherein the heat-dissipating substrate includes fins.
6. The application specific heat sink device in accordance with claim  
2 1, wherein the heat-dissipating stud comprises a material with a CTE  
relatively close to the CTE of the electronic component to be cooled.
7. The application specific heat sink device in accordance with claim  
2 1, wherein the heat-dissipating stud comprises a material with a CTE  
relatively intermediate between the CTE of the electronic component to be  
4 cooled and the heat-dissipating substrate.

8. The application specific heat sink device in accordance with claim  
2 1, wherein the heat-dissipating stud comprises a metal, a metal alloy or  
combinations thereof.

9. A method for manufacturing an heat sink device, comprising:  
2 forming a heat-dissipating substrate with one or more apertures  
extending from a first surface to a second surface of the heat-dissipating  
4 substrate;  
forming one or more heat-dissipating studs, wherein the one or more  
6 heat-dissipating studs are shaped and sized to mate within the aperture in  
the heat-dissipating substrate, extending from one side to the other of the  
8 aperture and mate with an electronic device to be cooled on one side of the  
aperture ; and  
10 attaching the heat-dissipating stud within the aperture of the  
substrate.

10. The method in accordance with claim 9, wherein the heat-  
2 dissipating stud comprises a material selected to have a relatively close CTE  
with the electronic device to be cooled.

11. The method in accordance with claim 9, wherein the heat-  
2 dissipating stud comprises a material selected to have an intermediate CTE  
between the heat-dissipating substrate and a device to be cooled.

12. The method in accordance with claim 9, further comprising the  
2 step of forming a cavity in a top surface of the heat-dissipating substrate;  
wherein the heat-dissipating stud is attached within the cavity formed on the  
4 heat-dissipating substrate.

13. The method in accordance with claim 9, wherein the heat-  
2 dissipating substrate includes fins.